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10/762,120	01/21/2004	Paul A. Hosier	D/A2019	3957

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EXAMINER	
CUTLER, ALBERT H	
ART UNIT	PAPER NUMBER
2622	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/762,120	HOSIER ET AL.	
	Examiner	Art Unit	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to application 10/762,120 filed on January 21, 2004. Claims 1-14 are pending in the application and have been examined by the examiner.

Information Disclosure Statement

2. The Information Disclosure Statements (IDS) mailed on January 21, 2004 and August 7, 2006 were received and have been considered by the examiner.

Claim Objections

3. Claim 7 is objected to because of the following informalities: Lack of clarity and precision. Claim 7 reads, "The apparatus of claim 7". A claim cannot depend from itself. Upon further examination, the Examiner has determined that claim 7 was most likely meant to depend from claim 6. Therefore, the Examiner will interpret claim 7 to read, "The apparatus of claim 6". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, and 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Stark(US Patent Application Publication 2002/0186312).

Consider claim 1, Stark teaches:

An imaging apparatus(figure 3, figure 6, paragraphs 0025, 0029), comprising:

a plurality of groups of photosensors(See figure 4C, the image sensor can be broken down into square groups of four photosensors. See paragraphs 0039-0040, 0085-0087);

a first output line for accepting signals from a first subset of groups of photosensors(See figures 4A and 4B, paragraphs 0085-0087, each group of four photosensors can be broken into subsets of two photosensors. Signals from two photosensors(i.e. a first subset), Q3 and Q4, are read out to a single sense amplifier(SA1, see figure 2) on a single output line(i.e. a first output line). See figure 2, paragraphs 0056-0057.);

a second output line for accepting signals from a second subset of groups of photosensors(Just like the first subset, additional subsets(i.e. second, third, etc.) are read out in the same fashion with two photosensors read out on the same line(i.e. second, third, etc. output lines). See figures 4A and 4B, which illustrate the two-photosensor subsets. Reading out an entire frame in this way results in halving the entire frame readout time, paragraph 0057.); and

connection means, associated with each group of photosensors, for selectably operating the group of photosensors as effectively one photosensor(Each group of four

photosensors can be read out at a time through a single amplifier(i.e. a connection means), thereby combining the outputs of the four photosensors into one signal, and allowing them to effectively act as one photosensor. See paragraph 0087.).

Consider claim 2, and as applied to claim 1 above, Stark further teaches that the first subset of groups of photosensors is substantially evenly distributed along a linear array(See figures 4A, 4B, and 4C. In figure 4C, the sensor is broken into groups of four photosensors. In figures 4A and 4B, these groups of four are further broken into groups of two. For instance, photosensors 30 and 32 of figure 4A form a first subset of a group of four. The two photosensors immediately adjacent photosensors 30 and 32 forms a second subset of a group of four. The next two immediately adjacent photosensors to the second subset form a first subset of a second group of four. And so on. Therefore, the first subset groups of photosensors are evenly distributed along a linear array by being distributed every other column, as in figure 4A, or every other line, as in figure 4B.).

Consider claim 3, and as applied to claim 2 above, Stark further teaches that the first subset of groups of photosensors is substantially interleaved with the second subset of groups of photosensors along the linear array(See figures 4A and 4B, claim 2 rationale. Since the two subsets are located every other line, or every other column, they are substantially interleaved.).

Consider claim 4, and as applied to claim 1 above, Stark further teaches each group of photosensors including at least two photosensors disposed along a direction of a linear array(See figures 4A, 4B, and 4C. Each group of four photosensors contains two groups of two photosensors disposed along the y-axis of the array as shown in figure 4A, or two groups of two photosensors disposed along the x-axis as shown if figure 4B.).

Consider claim 5, and as applied to claim 1 above, Stark further teaches that the connection means includes at least one switch interposed between two photosensors in the group of photosensors(See paragraphs 0053-0057, figure 2. Amplifier selector(AS) acts as a switch between photosensors UC3 and UC4.).

Consider claim 6, and as applied to claim 1 above, Stark further teaches of a high-resolution means for selectably transferring signals from a first photosensor in each group to the first output line, and transferring signals from a second photosensor in each group to the second output line(See paragraphs 0053-0055, figure 2. A first photosensor(UC3) can be read out through a first amplifier(SA1, i.e. a first readout line). A second photosensor(UC4) can then be read out through a second amplifier(SA2, i.e. a second readout line). Reading out of all of the photosensors produces the highest resolution image.).

Consider claim 8, Stark teaches:

A method of operating an imaging apparatus(figure 3, figure 6, paragraphs 0025, 0029), the apparatus including a plurality of groups of photosensors(See figure 4C, the image sensor can be broken down into square groups of four photosensors. See paragraphs 0039-0040, 0085-0087), a first output line(See figures 4A and 4B, paragraphs 0085-0087, each group of four photosensors can be broken into subsets of two photosensors. Signals from two photosensors(i.e. a first subset), Q3 and Q4, are read out to a single sense amplifier(SA1, see figure 2) on a single output line(i.e. a first output line). See figure 2, paragraphs 0056-0057.), and a second output line(Just like the first subset, additional subsets(i.e. second, third, etc.) are read out in the same fashion with two photosensors read out on the same line(i.e. second, third, etc. output lines). See figures 4A and 4B, which illustrate the two-photosensor subsets. Reading out an entire frame in this way results in halving the entire frame readout time, paragraph 0057.), comprising the steps of:

in a first mode(Low Resolution Mode, paragraphs 0056-0057), transferring signals from a first subset of groups of photosensors to the first output line(see above), and transferring signals from a second subset of groups of photosensors to the second output line(see above); and

in a second mode(High Resolution Mode, paragraph 0055), for each of a plurality of groups of photosensors(See figure 4C for a plurality of groups.), transferring signals from a first photosensor(UC3) in the group to the first output line(Vout1, figure 2), and transferring signals from a second photosensor(UC4) in the group to the second output line(Vout2, figure 2).

Consider claim 9, and as applied to claim 8 above, Stark further teaches the first mode(paragraphs 0056-0057) corresponds to a low-resolution operation and the second mode(paragraph 0055) corresponds to a high-resolution operation.

Consider claim 10, and as applied to claim 8 above, Stark further teaches in the first mode(Low resolution mode), effectively connecting at least two photosensors in the group to form a single photosensor(See paragraphs 0056-0057, figure 2.).

Consider claim 11, and as applied to claim 8 above, Stark further teaches that the first subset of groups of photosensors is substantially evenly distributed along a linear array(See figures 4A, 4B, and 4C. In figure 4C, the sensor is broken into groups of four photosensors. In figures 4A and 4B, these groups of four are further broken into groups of two. For instance, photosensors 30 and 32 of figure 4A form a first subset of a group of four. The two photosensors immediately adjacent photosensors 30 and 32 forms a second subset of a group of four. The next two immediately adjacent photosensors to the second subset form a first subset of a second group of four. And so on. Therefore, the first subset groups of photosensors are evenly distributed along a linear array by being distributed every other column, as in figure 4A, or every other line, as in figure 4B.).

Consider claim 12, and as applied to claim 11 above, Stark further teaches that the first subset of groups of photosensors is substantially interleaved with the second subset of groups of photosensors along the linear array(See figures 4A and 4B, claim 11 rationale. Since the two subsets are located every other line, or every other column, they are substantially interleaved.).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 7, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark in view of Koizumi et al.(US Patent 6,847,026).

Consider claim 7, and as applied to claim 6 above, Stark teaches of a high-resolution means(see claim 6 rationale). However, Stark does not explicitly teach that the high resolution means includes a shift register having a plurality of stages, each of at least two photosensors within a group being associated with a shift register stage.

Koizumi et al. is very similar to Stark in that Koizumi et al. teach of a solid state image pick-up apparatus(see Title) which can be broken into variable resolution groups of photosensors(see figures 7A, 7B, and 7C). Koizumi et al. similarly teaches of a high resolution mode(figure 7A) in which each photosensor of the imaging element is read out, a medium resolution mode(figure 7B) in which subsets of two photosensors are read out, and a low resolution mode(figure 7C) in which groups of four photosensors are read out.

However, in addition to the teachings of Stark, Koizumi et al. teach of a shift register(See figures 2, 9-11, column 9, line 56 through column 10, line 20, column 4, line 30 through column 5, line 29. The shift register is part of the Horizontal scanning circuit.) having a plurality of stages(301, figure 9), each of at least two photosensors within a group being associated with a shift register stage(See figure 2. Switch 10-1 connects the outputs(9-1) of two adjacent photosensors(for example 2-41 and 2-42). When a control signal B1SEL is applied to a first stage of the shift register, signal T2-1 is output, causing the readout of both photosensors.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use a horizontal scanning circuit including a shift register which has a plurality of stages as taught by Koizumi et al. to output the signals from the

photosensors taught by Stark for the benefit of reducing the parasitic capacitance and thus reducing undesirable effects in the image readout(Koizumi et al., column 1, lines 20-28, column 4, lines 65-67).

Consider claim 13, and as applied to claim 8 above, Stark does not explicitly teach of a shift register having a plurality of stages, each of at least two photosensors within a group is associated with a shift register stage.

Koizumi et al. is very similar to Stark in that Koizumi et al. teach of a solid state image pick-up apparatus(see Title) which can be broken into variable resolution groups of photosensors(see figures 7A, 7B, and 7C). Koizumi et al. similarly teaches of a high resolution mode(figure 7A) in which each photosensor of the imaging element is read out, a medium resolution mode(figure 7B) in which subsets of two photosensors are read out, and a low resolution mode(figure 7C) in which groups of four photosensors are read out.

However, in addition to the teachings of Stark, Koizumi et al. teach of a shift register(See figures 2, 9-11, column 9, line 56 through column 10, line 20, column 4, line 30 through column 5, line 29. The shift register is part of the Horizontal scanning circuit.) having a plurality of stages(301, figure 9), each of at least two photosensors within a group is associated with a shift register stage(See figure 2. Switch 10-1 connects the outputs(9-1) of two adjacent photosensors(for example 2-41 and 2-42). When a control signal B1SEL is applied to a first stage of the shift register, signal T2-1 is output, causing the readout of both photosensors.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use a horizontal scanning circuit including a shift register which has a plurality of stages as taught by Koizumi et al. to output the signals from the photosensors taught by Stark for the benefit of reducing the parasitic capacitance and thus reducing undesirable effects in the image readout(Koizumi et al., column 1, lines 20-28, column 4, lines 65-67).

Consider claim 14, and as applied to claim 13 above, Stark does not explicitly teach in the first mode(Low Resolution Mode), operating the shift register so that, for a plurality of groups of photosensors, only one shift register stage effectively operates the group.

However, Koizumi et al. teach operating the shift register so that, for a plurality of groups of photosensors, only one shift register stage effectively operates the group(Koizumi et al. teach of applying a signal from a shift register(see claim 13 rationale). Only one shift register operates a group of photosensors because all the photosensors in the group share the same output(9-1) as shown if figure 2. Thus, an input signal from one shift register stage causes the output of(i.e. operates) all the photosensors connected to that shift register stage(i.e. all the photosensors in the group. See column 5, lines 1-8.).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

NGOC-YEN VU
SUPERVISORY PATENT EXAMINER